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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,087	04/28/2005	Masayuki Itoh	Q87751	9468

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EXAMINER

ROE, JESSEE RANDALL

ART UNIT	PAPER NUMBER
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1793

MAIL DATE	DELIVERY MODE
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01/10/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/533,087

Applicant(s)

ITOH ET AL.

Examiner

Jessee Roe

Art Unit

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/ are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20 January 2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of the Claims

Claims 1-9 are pending.

Claim Objections

Claim 1 is objected to because of the following informalities: "at least one copper pool phases" should be changed to "at least one copper pool phase". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 6-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 recites the limitation "the step of infiltrating copper or a copper alloy" in claim 6. There is insufficient antecedent basis for this limitation in the claim.

Claim 7 is rejected because it depends from a rejected base claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 6-7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kashiwagi al. (US 4,640,999).

In regards to claims 1-2 and 6-7, Kashiwagi et al. ('999) disclose contact materials consisting of between 20 and 70 weight percent copper, between 5 and 70 weight percent molybdenum, and between 5 and 70 weight percent chromium (col. 4, lines 14-22). Kashiwagi et al. ('999) further specify that the metal particles would be uniformly distributed and the particle size of each metal would be -100 meshes (less than 149 μm) (col. 4, lines 14-22).

Still regarding claim 1, The Examiner notes that the composition and grain size of the copper in the material disclosed by Kashiwagi et al. ('999) overlaps the composition and grain size of the copper in the instant invention, which is a prima facie case of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed amount and size of copper from the amount and size of copper disclosed by Kashiwagi et al. ('999) because Kashiwagi et al. ('999) disclose the same utility throughout the disclosed ranges.

Still regarding claims 1 and 6-7 and in regards to claim 2, although Kashiwagi et al. ('999) do not specify at least one copper pool phase being contained in an amount

of 10 to 50 weight percent and a Mo-Cu composite phase, Kashiwagi et al. ('999) do specify pressing a mixture of molybdenum powder, chromium powder, and copper powder; sintering the powder mixture; and infiltrating the porous matrix with copper (col. 1, line 67 – col. 2, line 56). Therefore, at least one copper pool phase being contained in an amount of 10 to 50 weight percent; a Mo-Cu composite phase; and at least copper pool phase with an average short diameter of 50 μm to 200 μm would be expected because Kashiwagi et al. ('999) disclose an overlapping composition and substantially the same process. MPEP 2112.01 I.

In regards to claims 3 and 9, Kashiwagi et al. ('999) disclose cutting and machining into the shape of a disc, which reads on plastic deformation (col. 5, lines 26-34).

In regards to claim 4, Kashiwagi et al. ('999) disclose using the copper-molybdenum-chromium composite as a contact material for a vacuum interrupter (member) (abstract).

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kashiwagi et al. (US 4,640,999) alone, or alternatively with evidence from Sakuma et al. (US 4,661,666).

In regards to claim 5, Kashiwagi et al. ('999) disclose using the copper-molybdenum-chromium composite as a contact material for a vacuum interrupter (member) (abstract). Although Kashiwagi et al. ('999) do not specify that the vacuum interrupter would be a heat sink member, one of ordinary skill in the art would expect

that the vacuum interrupter would be capable of heat dissipation (heat sink) because the vacuum interrupter would be electrically connected to another device (such as a transmission device). Alternatively, Sakuma et al. ('666) disclose that vacuum interrupters would dissipate heat from a coil (col. 1, lines 18-38).

Therefore, it would be expected that the vacuum interrupter, as disclosed by Kashiwagi et al. ('999) would be a heat sink member because Sakuma et al. ('666) disclose that vacuum interrupters would dissipate heat from a coil (col. 1, lines 18-38).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kashiwagi et al. (US 4,640,999) alone, or alternatively with evidence from Sakuma et al. (US 4,661,666) as applied to claim 5 above, and further in view of Isberg et al. (US 6,239,514).

In regards to claim 8, Kashiwagi et al. ('999) alone, or alternatively with evidence from Sakuma et al. ('666) disclose copper-molybdenum-chromium composite as a contact material for a vacuum interrupter as shown above, but Kashiwagi et al. ('999) alone, or alternatively with evidence from Sakuma et al. ('666) do not specify that the vacuum interrupter would be used in a semiconductor apparatus.

Isberg et al. ('514) disclose using a vacuum interrupter in a semiconductor device in order to utilize a light source as an irradiator (col. 2, lines 45-63 and col. 3, line 40 – col. 4, line 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the vacuum interrupter, as disclosed by Kashiwagi et al. ('999), or alternatively with evidence from Sakuma et al. ('666), in semiconductor power devices such as thyristors, MOSFETs and IGBTs, as disclosed by

Isberg et al. ('514), in order to use a light source as an irradiator, as disclosed by Isberg et al. ('514) (col. 2, lines 45-63 and col. 3, line 40 – col. 4, line 3).


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jesse Roe whose telephone number is (571) 272-5938. The examiner can normally be reached on Monday-Friday 7:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JR


**ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700**

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